

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Inventor: Jun HIRANO et al.

Art Unit 2617

Appln. No.: 10/550,529

Exr. O. Obayanju

Filed: July 12, 2006

Conf. No. 4475

For: RADIO COMMUNICATION METHOD AND RADIO COMMUNICATION
DEVICE

AMENDMENT UNDER 37 C.F.R. § 1.116

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated April 28, 2011, the following amendments and
remarks are respectfully submitted:

IN THE CLAIMS

Please amend the claims to read as follows:

Listing of Claims

Claims 1-60. (Cancelled).

61. (New) A radio communication device in whose communication area other radio communication devices operate, comprising:

a detection section that detects a number of the other radio communication devices within the communication area of the radio communication device during a time slot, the time slot being used by the radio communication device, and the other radio communication devices operating during the time slot being used by the radio communication device; and

a contention resolution section that performs contention resolution processing when the detection section detects one or more of the other radio communication devices operating during the time slot being used by the radio communication device,

said contention resolution section comprising:

a time slot dividing section that divides the time slot into a plurality of divided time slots, and

a slot setting section that sets at least one of the plurality of divided time slots as a time slot to be used by the radio communication device,

wherein a number of the plurality of divided time slots is 2^M where M is an integer, and $2^{M-1} \leq N < 2^M$ is satisfied where N is the detected number of the other communication devices.

62. (New) The radio communication device according to claim 61, wherein the time slot dividing section divides the time slot into a plurality of equal width divided time slots.

63. (New) The radio communication device according to claim 61, wherein the contention resolution section comprises an exchanging section that exchanges identification information of the radio communication device with identification information of the other radio communication devices, and the slot setting section is configured to select a higher priority slot which can be used at a higher priority by the radio communication device among the plurality of divided time slots, based on a comparison result of the identification information of the radio communication device with the identification information of the other radio communication devices.

64. (New) The radio communication device according to claim 61, further comprising a time slot identification information sending section that sends identification information of the time slot set to be used by the radio communication device to the other radio communication devices, so that the other radio communication devices select their time slots to be used based on the received identification information of the time slot.

65. (New) The radio communication device according to claim 61, further comprising a higher priority communication section that accesses a wireless medium at a higher priority in the time slot set to be used by the radio communication device, using a waiting time shorter than another waiting time used for the other radio communication devices.

66. (New) The radio communication device according to claim 65, further comprising a lower priority communication section that accesses the wireless medium at a lower priority in other time slots than the time slot set to be used by the radio communication device, using a waiting time longer than another waiting time used for the other radio communication devices.

67. (New) The radio communication device according to claim 61, further comprising a synchronization section that synchronizes with the other radio communication devices regarding a common period which is determined among the radio communication devices.

68. (New) The radio communication device according to claim 61, wherein the radio communication device comprises a time slot resetting section that resets the time slot by decreasing the number of the plurality of divided time slots in the time slot based on the detected number of the other radio communication devices, when the detection section detects that the other radio communication devices which use a lower priority time slot shut down.

69. (New) A radio communication method being performed by a radio communication device in whose communication area other radio communication devices operate, comprising:

detecting a number of the other radio communication devices within the communication area of the radio communication device during a time slot, the time slot being used by the radio communication device, and the other radio communication devices operating during the time slot being used by the radio communication device; and

performing contention resolution processing when the radio communication device detects one or more of the other radio communication devices operating during the time slot being used by the radio communication device,

wherein the radio communication device divides the time slot into a plurality of divided time slots, and sets at least one of the plurality of divided time slots as a time slot to be used by the radio communication device, and

wherein a number of the plurality of divided time slots is 2^M where M is an integer, and $2^{M-1} \leq N < 2^M$ is satisfied where N is the detected number of the other communication devices.

70. (New) The radio communication method according to claim 69, wherein the radio communication device divides the time slot into a plurality of equal width divided time slots.

REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the above amendments and the following remarks.

To expedite prosecution, claims 50-60 have been cancelled, and claims 61-70 have been newly added.

New claims 61 and 69 are supported, for example, at page 25, lines 10-23 (corresponding to paragraph [0134] in the published U.S. application), page 46, line 12 - page 47, line 2 (corresponding to paragraphs [0192] and [0193] in the published U.S. application), and FIG. 1 of the specification as filed. (It should be noted that references herein to the specification and drawings are for illustrative purposes only and are not intended to limit the scope of the invention to the referenced embodiments).

New claims 62 and 70 are supported, for example, at page 12, lines 3-18 (corresponding to paragraph [0044] in the published U.S. application), and page 22, lines 14-25 (corresponding to paragraph [0126] in the published U.S. application) of the specification as filed.

New claims 63-68 correspond to canceled claims 52-55, 57, and 59, respectively. No new matter is added.

Claims 50, 51, and 53-60 were rejected under 35 U.S.C. §103(a) as being unpatentable over Haartsen (US 2002/0126692) (hereinafter, "Haartsen") in view of Montano et al. (US 7,280, 518) (hereinafter, "Montano") and further in view of Chuah (US 2003/0214928) (hereinafter, "Chuah"). Claim 52 was rejected under 35 U.S.C. §103(a) as being unpatentable over Haartsen in view of Montano and Chuah and further in view of Le et al. (US 7,154,877) (hereinafter, "Le"). To the extent that these rejections may be deemed applicable to the new claims presented herein, the Applicants respectfully traverse based on the points set forth below.

Claim 61 is directed towards a radio communication device and recites the features of:

“61. A radio communication device in whose communication area other radio communication devices operate, comprising:

a detection section that detects a number of the other radio communication devices within the communication area of the radio communication device during a time slot, the time slot being used by the radio communication device, and the other radio communication devices operating during the time slot being used by the radio communication device; and

a contention resolution section that performs contention resolution processing when the detection section detects one or more of the other radio communication devices operating during the time slot being used by the radio communication device,

said contention resolution section comprising:

a time slot dividing section that divides the time slot into a plurality of divided time slots, and

a slot setting section that sets at least one of the plurality of divided time slots as a time slot to be used by the radio communication device,

wherein a number of the plurality of divided time slots is 2^M where M is an integer, and $2^{M-1} \leq N < 2^M$ is satisfied where N is the detected number of the other communication devices.” (emphasis added)

As noted above, new claim 61 recites that, when the radio communication device detects one or more of the other radio communication devices operating during the same time slot, the radio communication device divides the time slot based on a number of the other radio communication devices operating during the same time slot, and sets at least one of the plurality of divided time slots as a time slot to be used by the radio communication device.

More specifically, new claim 61 recites the feature “...wherein a number of the plurality of divided time slots is 2^M where M is an integer, and $2^{M-1} \leq N < 2^M$ is satisfied where N is the detected number of the other communication devices.” According to this feature recited by claim 61, during contention resolution processing, the radio communication device divides the time

slot by 2^M (a power of 2), where M is an integer. Here, 2^{M-1} is equal to or smaller than N (N being the detected number of the other communication devices), and 2^M is greater than N . In the specification, “ M ” is exemplarily defined as a “SHARE_MODE parameter” and N is exemplarily defined as a “number of other IHCs” (see, e.g., FIG. 1). The formula $2^{M-1} \leq N < 2^M$ indicates the relationship between the “SHARE_MODE parameter” and the “number of other IHCs,” as exemplarily illustrated in FIG. 1:

$M=1$ if $N=1$;
 $M=2$ if $N=2, 3$;
 $M=3$ if $N=4 \dots 7$;
 $M=4$ if $N=8 \dots 15$;
 $M=5$ if $N=16 \dots 31$;
 ...

Neither Haartsen nor Montano or Chuah, whether considered individually or in combination, teach or suggest the above-noted feature of “...wherein a number of the plurality of divided time slots is 2^M where M is an integer, and $2^{M-1} \leq N < 2^M$ is satisfied where N is the detected number of the other communication devices.” as recited by claim 61. Montano merely discloses that “Management time slots” (MTSs) can “...be shared among multiple devices 321-325” (see Montano, col. 16, lines 1-5), but does not teach or suggest anything similar to the above-noted feature of claim 61. Furthermore, none of the other references teach or suggest anything similar to this feature of claim 61.

Accordingly, Haartsen, Montano, and Chuah, even if combined as proposed in the Office Action, still would lack at least the above-noted features of claim 61, and allowance of claim 61 and all claims dependent therefrom is warranted for at least this reason. Claim 69 recites substantially the same features distinguishing apparatus claim 61 from Haartsen, Montano and Chuah, though does so with respect to a method. Accordingly, it is respectfully submitted that

allowance of claims 61 and 69 and all claims dependent therefrom is warranted.

In view of the above, it is submitted that this application is in condition for allowance, and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a personal communication, the Examiner is requested to e-mail the undersigned at the address listed below.

Respectfully submitted,

/James E. Ledbetter/

Date: July 28, 2011
JEL/DEA/att

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